The Adam and Eve Robot Scientists for the Automated Discovery of Scientific Knowledge

ROSS KING, University of Manchester

A Robot Scientist is a physically implemented robotic system that applies techniques from artificial intelligence to execute cycles of automated scientific experimentation. A Robot Scientist can automatically execute cycles of hypothesis formation, selection of efficient experiments to discriminate between hypotheses, execution of experiments using laboratory automation equipment, and analysis of results. The motivation for developing Robot Scientists is to better understand science, and to make scientific research more efficient. The Robot Scientist 'Adam' was the first machine to autonomously discover scientific knowledge: both form and experimentally confirm novel hypotheses. Adam worked in the domain of yeast functional genomics. The Robot Scientist 'Eve' was originally developed to automate early-stage drug development, with specific application to neglected tropical disease such as malaria, African sleeping sickness, etc. We are now adapting Eve to work with on cancer. We are also teaching Eve to autonomously extract information from the scientific literature.